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ROBERT ARMSTRONG HOUSE
88 RANGE ROAD
WINDHAM, NEW HAMPSHIRE

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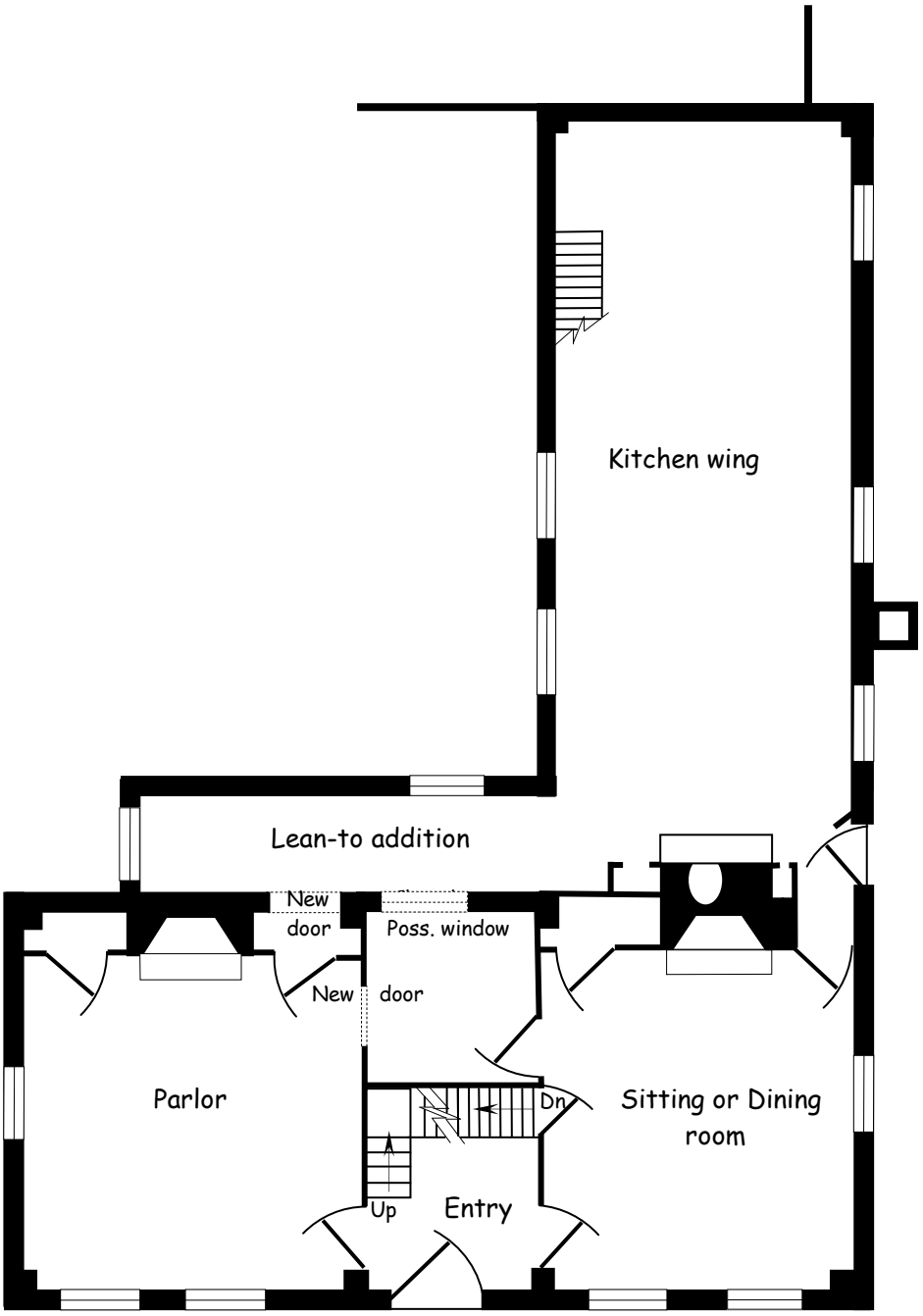
JUNE 17, 2007

This report is based on an inspection of the Robert Armstrong House on the afternoon of June 12, 2007. The purpose of the inspection was to ascertain the physical condition of the house, to study and date its significant architectural features, and to develop a plan for its stabilization pending determination of its future use. Present at the inspection were Dr. Joyce McKay of the Bureau of Environment, New Hampshire Department of Transportation, representing the owner of the property; Lynne Emerson Monroe of The Preservation Company, consultants; and Frank Whittemore of The Preservation Company, who is also a restoration contractor.

Description of the house: The Robert Armstrong House is described in a New Hampshire Division of Historical Resources inventory form that was completed by Lynne Emerson Monroe and Kari Ann Federer of The Preservation Company on January 22, 1992. Based on that form, the house was determined to be potentially eligible for listing in the National Register of Historic Places in 1992. Eligibility of the house was confirmed by a physical inspection of the property on August 27, 2001.

Basically, the Armstrong House is a one-room-deep, two-story house with two chimneys placed against the inside of its rear walls. The house has a compact triple-run staircase behind the front door, leaving space behind the staircase (where a central chimney would have been located in an older house) to provide small rooms on both first and second floors. This type of house has been somewhat inappropriately named an "I-house" by people interested in vernacular architecture, because the first examples were noticed and classified in states with names beginning with the letter "I:" Illinois, Indiana, and Iowa.

A general plan (not to scale) of the first floor of the Armstrong House is given below.



ROBERT ARMSTRONG HOUSE

SCHEMATIC FLOOR PLAN

Not to scale

Inspection on June 12, 2007, pointed toward a probable construction date of 1830-35, based on the attributes described below. The Armstrong family history, as provided in Leonard A. Morrison's *The History of Windham* (1883), does not provide any clear generational change to point to a likely construction date for the current dwelling except for the death of Robert Armstrong's wife, Alice Park Armstrong, in 1830. The discussion below deals with the details of framing, stone splitting, and joinery in the house as a means of further documenting its architectural significance and of dating the house as accurately as possible.

It is apparent that a remodeling of the exterior of the house took place around 1850. Pending further investigation of its framing, it appears that the entire existing wing of the house was also constructed circa 1850, together with a lean-to extension across the rear of the main building. Since the main body of the house lacks a large cooking fireplace or a brick oven, it seems likely that the dwelling always had a wing to provide kitchen facilities, but attributes of the current wing, described below, show that it postdates the main house. Presumably the original kitchen wing was a one-story extension of the main house, whereas the current wing is a 1½-story structure with high knee walls that are pierced by six-over-three windows on the second floor, mostly placed directly above the window openings on the first story.

Dating the Armstrong House was attempted through three diagnostic tools: examination of the house frame, examination of stone splitting technology, and examination of the interior joinery. As noted above, the exterior was quite thoroughly remodeled circa 1850, so interior joinery provides almost the only stylistic evidence for the original date of construction.

The frame of the main body or carcass of the house appears to be standard for the early nineteenth century, with some elements of the frame perhaps being a bit smaller in dimensions than usual. The house is one room in depth, with four structural bents that define the two gable end walls and the center or stairhall bay. The major visible members of the frame are hewn from pine. The house has rising braces extending from the wall posts to the girts or to the wall plates above each story. Joists of the second floor frame have been exposed in the western parlor, and are seen to be sawn chestnut planks running from front to rear, placed about 28 inches on centers, and notched into the girts. Joists of the first floor frame are sleepers or tree boles, although many of these have deteriorated from dampness and been replaced or sistered with two-inch planks nailed to their sides.

Common rafter roof: Above this apparently standard carcass is an unusual and interesting roof frame. The frame consists of hewn common rafters of pine or hemlock. The rafters are half-lapped and pinned together at the top and have no ridgepole. The rafters are slightly tapered, being about one inch deeper at their feet than at their tops.

Rather than being spaced evenly, some of the rafter pairs are placed directly over points of support below. In addition to the gable-end rafters, there are pairs of rafters above the hall or entry posts. There are also rafters above the midpoints of the two second-story chambers, as is usual.

There is also an additional rafter pair in an unusual location. Since the Armstrong House has a triple-run staircase that fills the width of its central or entry bay, and since the house also has rooms behind the staircase (in the space that would be filled by a central chimney in an older house) access to the small second-floor central chamber had to be provided by moving the eastern partition of the stairhall to the east, providing a passageway to the rear room between the side of the staircase and the partition. One of the rafter pairs is placed above this partition, in a location where no rafters would normally be located.

In some cases, the large, hewn rafters described above are spaced too far apart to provide enough support for the horizontal roof sheathing boards to prevent them from deflecting under snow loading and probably developing a permanent sag. To provide additional support, pairs of light, sawn rafters have been inserted, as needed, between the larger hewn rafters. These sawn rafter pairs are wedged under their feet and therefore have the appearance of later additions, but they could be parts of the original roof system. They deserve closer study.

The use of common rafters in the Armstrong House roof points to a date after 1830. Virtually all houses in eastern and central New Hampshire utilized rafter-and-purlin roof systems until about 1830. During the 1830s, this traditional roof framing methods was slowly supplanted by roofs framed with common rafters, which had long been the norm in the Connecticut River Valley of New Hampshire.

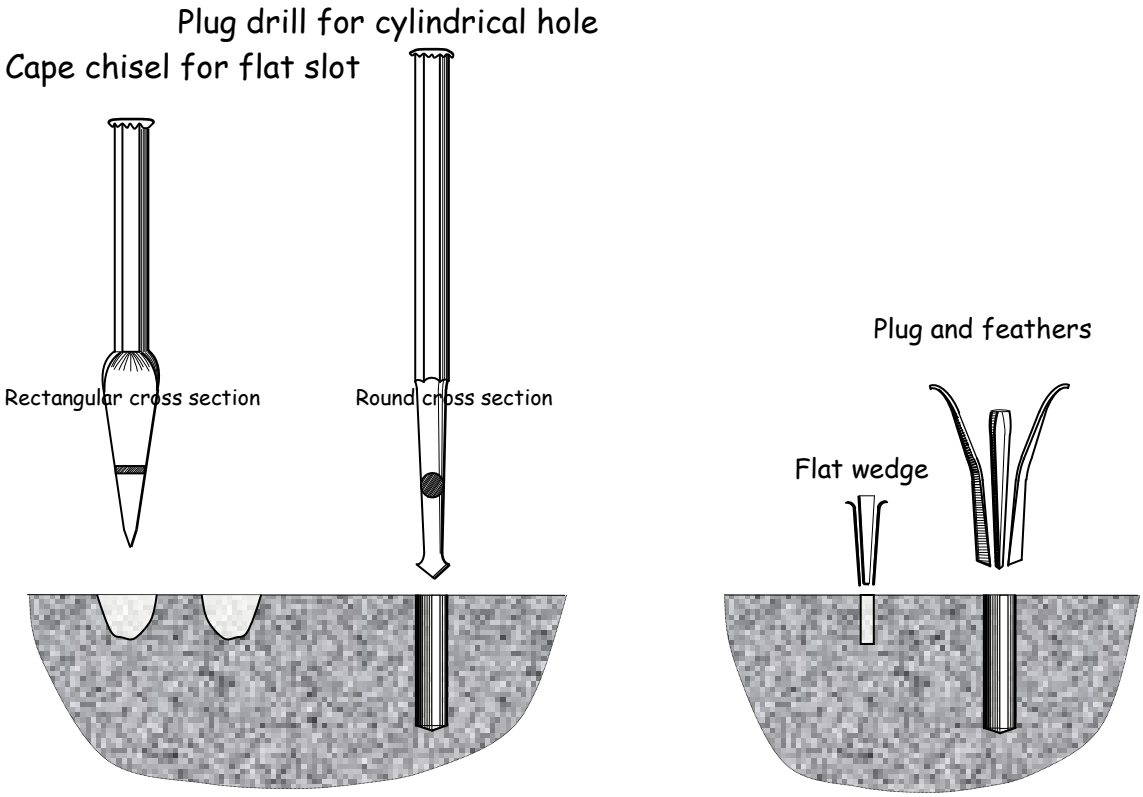
Thus far, the earliest dated examples of common rafter roofs in eastern or central New Hampshire are seen in two tenant houses on Atkinson Street in Portsmouth, within the Strawbery Banke Museum, and in the brick Charles Graham-Stiles Bridges House in East Concord. Research by Strawbery Banke indicates that the two Portsmouth tenant houses were built by local merchant Leonard Cotton in 1834. Their light rafters are sawn. The Graham-Bridges House dates from about 1835. Its rafters are sawn from two-inch planks.

The appearance of the unorthodox common rafter roof frame in the Robert Armstrong House, then, suggests a date in the 1830s. The fact that the main rafters are hewn, rather than sawn, might suggest a date close to 1830, since most (but not all) rafter-and-purlin roof frames of the early nineteenth century had hewn rafters.

Stone splitting technology: A second diagnostic feature of the Armstrong House is provided by the stone splitting technology that is identifiable in the granite foundation stones of the main cellar, and is also visible in some of the underpinning stones that cap the foundation walls and are exposed to view above grade on the exterior. Each method of splitting granite leaves distinctive marks at the edge of the stone, and these marks reveal whether a given piece of granite was quarried or split before or after about 1830. Where splitting techniques are visible, the stones of the main portion of the house uniformly reveal flat indentations that indicate that they were split by flat wedges inserted into narrow, chiseled slots.

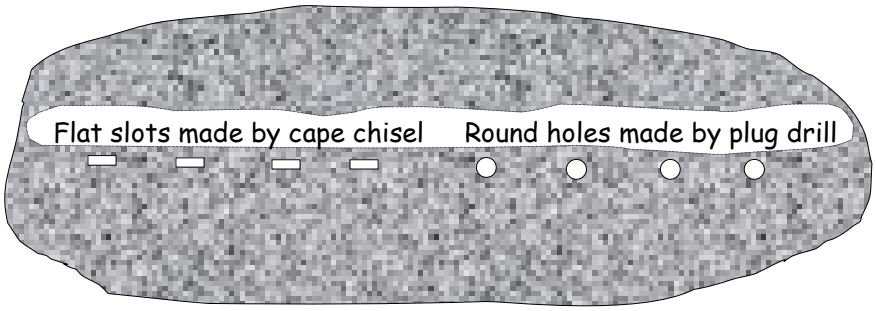
Prior to about 1830, the procedure for splitting granite entailed the cutting of a line of shallow slots in the face of the stone, using a tool called a cape chisel, struck with a heavy hammer. Small, flat steel wedges were placed between shims of sheet iron and driven into these slots, splitting the stone.

The new splitting method, introduced circa 1830, used a "plug drill," which had a V-shaped point and was rotated slightly between each blow of the hammer, creating a round hole two or three inches deep. Into this hole were placed a pair of half-round steel shims or "feathers," and between these was driven a wedge or "plug" which exerted outward pressure and split the stone. The advantage of the "plug-and-feathers" method of splitting was the greater depth within the stone at which the wedges exerted their pressure, thus allowing larger pieces to be split more accurately.



The new splitting technology seems to have spread rather rapidly through the granite quarrying centers of New England, although one is likely to find evidence of both old and new methods being used concurrently in stonework of the 1830s, especially in rural areas. The technique employed on a given stone can often be seen on the split face, and provides some aid in dating granite masonry. The old, flat-wedge method is marked by a series of slot-like depressions which extend inward an inch or so from the edges of the split stone. The plug-and-feathers method leaves a row of rounded holes, two or three inches deep and usually about six inches apart.

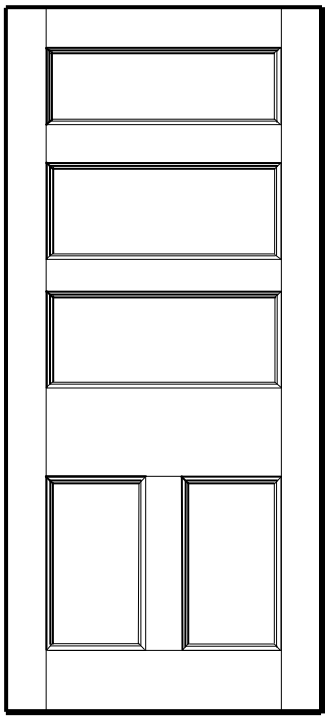
When seen on the surface of a stone that was prepared for splitting but never split, these slots or holes appear as shown below:



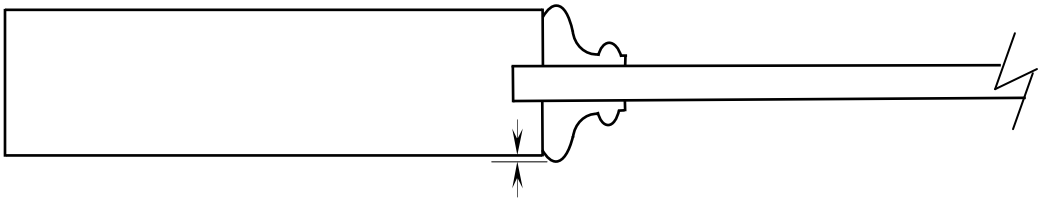
Since the flat-wedge method is seen uniformly in the stonework beneath the main portion of the Armstrong House (as distinct from the wing), the evidence provided by the stonework of the house corroborates the evidence provided by the common rafter roof system in suggesting that the house does not greatly postdate 1830.

Interior joinery: Except in the wing, which appears to have been reconstructed around 1850, the interior joinery of the Armstrong house is largely unaltered from the date of construction. This joinery is transitional in nature. Most of the mouldings are characteristic of the federal style of architecture, which persisted in New Hampshire from about 1800 to about 1830. A few architectural features and a few mouldings, however, clearly derive from the Greek Revival style, and specifically point to the joiner's familiarity with the architectural guidebook that introduced the Grecian style into New England, Asher Benjamin's *The Practical House Carpenter* (1830). When New Hampshire houses combine federal-style and Greek Revival features, they may usually be dated to the early 1830s.

Among the most remarkable features of the house are the interior doors. Throughout the building, the doors exhibit a highly unusual panel arrangement composed of three horizontal panels above two vertical panels:



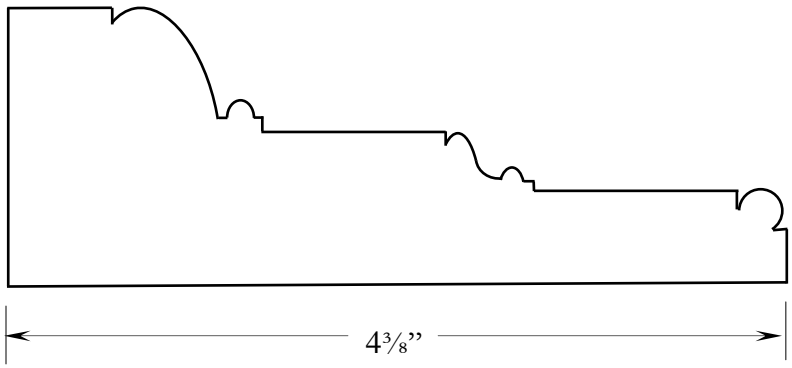
The panels of these doors are flat. The doors leading from the parlor and front sitting room or dining room to the stairhall are double-faced, with applied mouldings around the margins of the panels on both sides:



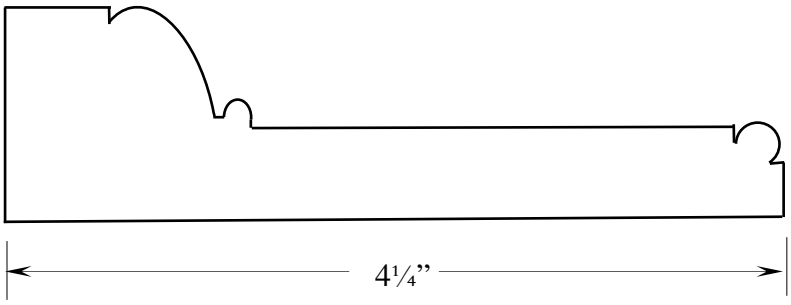
Other such doors on the first story have applied mouldings on the room sides only. Doors on the second story share the same panel arrangement but have no applied mouldings.

While the applied mouldings around the panels of the first-story doors are federal in style, they have one characteristic that indicates a relatively late date: the curve of the ogee projects slightly above the surface of the stiles and rails, as indicated by the arrows on the cross-sectional drawing above. This projection is usually seen on doors dating from the point of transition from the late federal style to the Greek Revival.

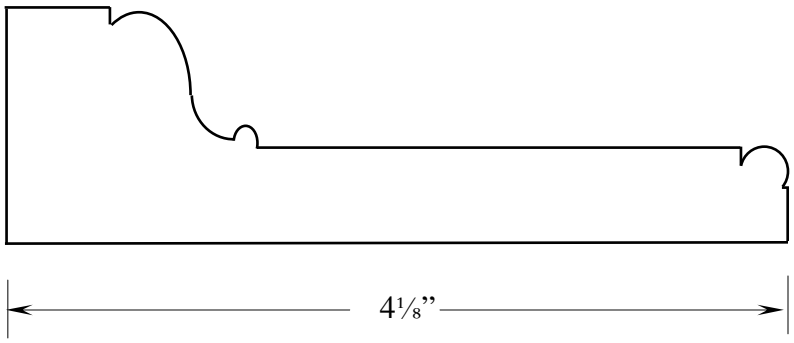
The preponderance of joinery in the Armstrong House is federal in style, and might have been seen in any house built between about 1800 and about 1830. Examples of this type of detailing are given below.



Parlor door and window casings

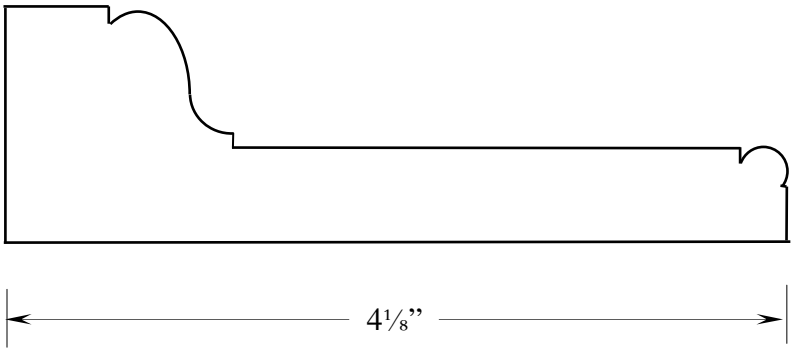


Dining room door and window casings



Lower front stairhall casings

(This backband moulding is also applied, inverted, at the bottom of the stair stringer.)

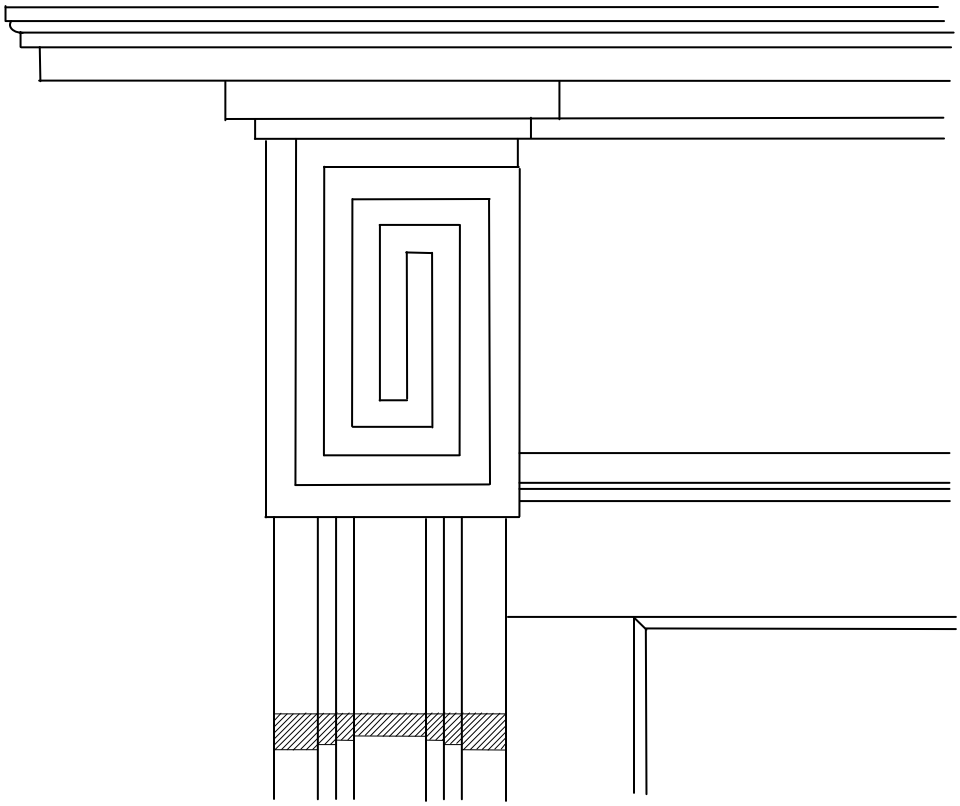


Upper front stairhall, upper and lower rooms behind stairhall, and dining room chamber

Like the casings throughout much of the house, the mantelpieces in most rooms are conservative in nature, reflecting late federal-style design. The same is true of chair rail and baseboard profiles.

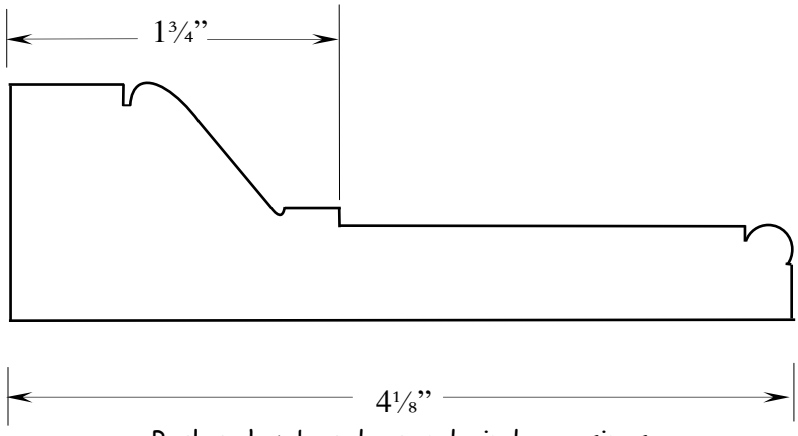
The most advanced style of joinery in the house is seen in the chamber over the parlor. This room has a mantelpiece that is fully Grecian in style. This feature, together with a characteristic moulding that is employed in its design and also appears on the mantelpiece in the dining room chamber, reveals the joiner's familiarity with the book that established the Greek Revival style in New England: Asher Benjamin's *The Practical House Carpenter* (1830).

The key stylistic feature of the mantelpiece in the parlor chamber is the Greek key, an angular fret that Benjamin illustrated several times in *The Practical House Carpenter*, usually as the decoration of a corner block at the upper angle of a doorway or window surround. In one case (Plate 50), Benjamin illustrated the use of the feature much as it is seen in the Armstrong house (below).



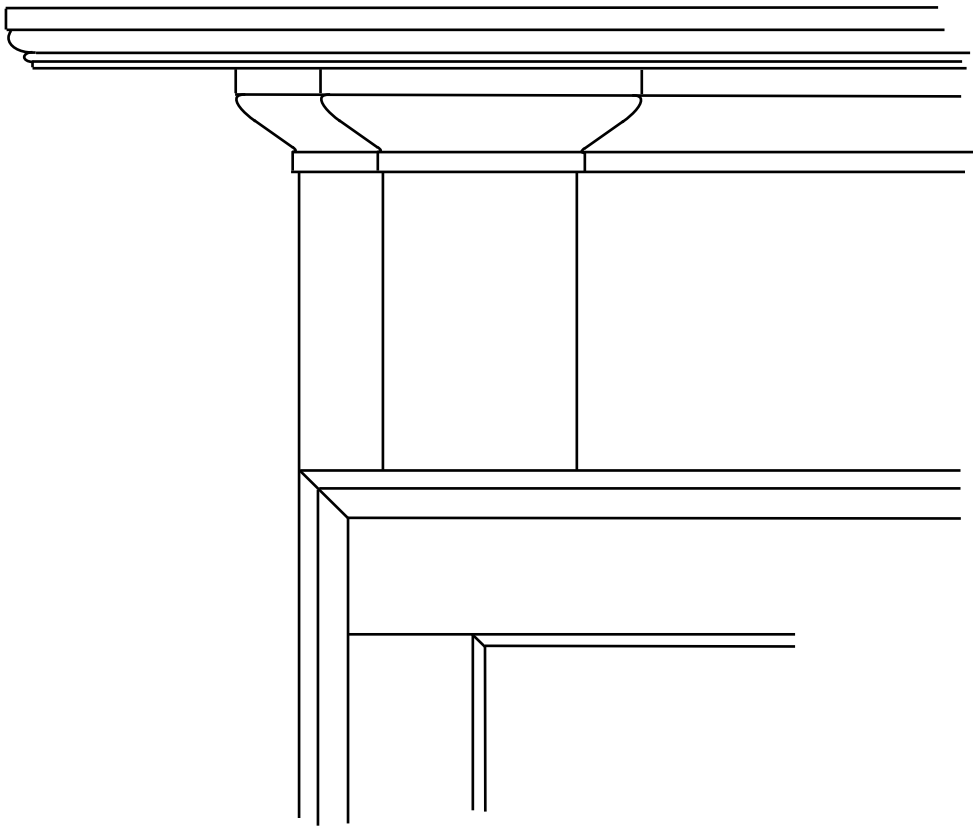
Parlor chamber mantelpiece

The door and window casings in this chamber are also Grecian in style. They contrast with the conservative federal-style casings in other rooms, shown on preceding pages. The backband mouldings of these casings are composed of an extremely flat Grecian ovolo moulding and broad fillets. Such backbands would have been recognized as characteristic of the incoming Greek Revival style by joiners of the early 1830s, who would have had to obtain new moulding tools to fashion such features. As with the fret shown above, these new mouldings were illustrated in Asher Benjamin's *The Practical House Carpenter* (1830).



Parlor chamber door and window casings

This same Grecian ovolo moulding is employed as a bed moulding beneath the mantelshelf of the chimneypiece in the dining room chamber. While this second mantelpiece is not overtly Grecian in style, the presence of this moulding shows that both mantelpieces were executed by the same joiner at the same time, thereby linking the new Grecian moulding with the other, more conservative, joinery seen throughout the front of the house.



Dining room chamber mantelpiece

Kitchen wing: While the front portion of the Armstrong House remains largely unchanged from the date of its construction except for the adaptations noted on the floor plan, the kitchen wing of the house appears to have been completely rebuilt around 1850. While almost all "I-houses" have a one story or a story-and-a-half kitchen wing, the existing wing bears strong evidence of dating from some twenty years after the completion of the main house.

Examination of the framing of the kitchen wing is not currently possible in any detail. When saturated lath, plaster, and insulation are removed from areas of the wing, however, it should be possible to look for technological evidence that may shed further light on the date of the wing, and possibly on reasons for the replacement of a former wing.

Meanwhile, examination of the granite foundation stones of the wing revealed that many of these stones bear the cylindrical drill marks of the plug drill, in contrast to the flat indentations seen on

stones under the main part of the house. As noted above, this evidence normally denotes a date after about 1830. In any case, it is clear that the stone masonry of the foundation of the main house and that of the foundation of the wing date from two different periods.

The chimney at the rear of the dining room fireplace incorporates a brick oven that faces into the kitchen wing. The cast iron oven door bears the words, IRON FOUNDRY SOUTH NEWMARKET, N. H. 1849. It seems clear that the earlier cooking arrangements of the house were supplanted by this oven in or after 1849. Beside the oven door is a low thimble for a stove. This apparently denotes the use of a kitchen range in this room in conjunction with the brick oven.

All of this evidence suggests that the kitchen wing and its cooking arrangements were completely modernized in or after 1849. The lean-to addition at the rear of the house was probably added at this time to permit access between the new kitchen and the parlor. Perhaps this arrangement was made to permit two households, living under the same roof, to share access to the kitchen from both the east and the west sides of the main house. It is perhaps significant that Robert Armstrong (1779-1849), the apparent builder of the present dwelling, died in 1849. Thereafter his son Robert (b. 1812), who seems to have lived under the same roof before and after his marriage in 1841, succeeded to full ownership of the property. It seems likely that the younger Robert and his wife modernized the kitchen at that time, apparently taking advantage of the increasing availability of cast iron cooking ranges during the 1830s and 1840s.

Interestingly, there is little evidence that stoves were installed in the fireplaces of the front of the house during the nineteenth century.